

CLAIMS

What is claimed is:

1. A method for improving the reliability of a channel quality indicator (CQI) message in a wireless communications network, comprising the steps of:

- a) receiving the CQI message;
- b) decoding the CQI message;
- c) computing a decision metric value for each symbol in the CQI message;
- d) determining a largest decision metric value;
- e) determining a second largest decision metric value; and
- f) determining the reliability of the CQI message by comparing the values obtained in steps (d) and (e).

2. The method of claim 1, further comprising the steps of:

- g) counting a number of erroneous CQI messages received over a time interval;
- h) at the end of the time interval, comparing the number of erroneous CQI messages with a threshold value; and
- i) if the number of erroneous CQI messages exceeds the threshold value, then signaling a radio network controller to adjust the transmission power of a wireless transmit/receive unit which sent the CQI messages.

3. The method of claim 1, further comprising the steps of:

- g) counting a number of erroneous CQI messages received;
- h) comparing the number of erroneous CQI messages with a threshold value;
- i) if the number of erroneous CQI messages exceeds the threshold value, then signaling a radio network controller to adjust the transmission power of a wireless transmit/receive unit which sent the CQI messages; and

j) if the number of erroneous CQIs does not exceed the threshold value, then repeating the method starting from step (a) for the next CQI.

4. The method of claim 1, further comprising the step of:

g) discarding the CQI message when the comparison fails to meet a given criteria.

5. The method of claim 4, wherein the criteria in step (g) is if the difference between the largest decision value and the second largest decision value is less than a predetermined value.

6. The method of claim 5, wherein the predetermined value is between 0 dB and 2 dB.

7. The method of claim 5, wherein the predetermined value is less than 1 dB.

8. The method of claim 4, wherein the criteria in step (g) is if the ratio of the second largest decision value to the largest decision value is greater than a predetermined value.

9. The method of claim 1, further comprising the step of:

g) periodically reporting via an Iub message a total number of CQI messages received, a number of false CQI messages received, and a number of CQI messages missed over a fixed time period.

10. A method for improving the reliability of a received message representing quality of a transmission channel in a wireless communication system, comprising the steps of:

a) receiving a channel quality indicator (CQI) message from a wireless transmit and receive unit (WTRU);

b) decoding the CQI message;

c) obtaining at least two different values representative of the decoded CQI message; and

d) comparing the at least two values to determine the reliability of the CQI message.

11. The method of claim 10, further comprising the step of:

e) taking an action based upon the results of step (d).

12. The method of claim 11, wherein step (e) includes providing outer loop power control.

13. The method of claim 10, wherein step (c) includes deriving the at least two values as representing a largest magnitude of a decision metric and a second largest magnitude of the decision metric.

14. The method of claim 13, wherein step (d) includes calculating a difference between the decision metric having the largest magnitude and the decision metric having the second largest magnitude, in decibels.

15. The method of claim 10, wherein step (d) includes calculating a ratio of the energy of the decision metric having a largest magnitude to the sum of the energy of all other decision metrics.

16. A system for determining the quality of a transmission channel in a wireless communication system, comprising:

at least one wireless transmit and receive unit, including generating means for generating a channel quality indicator (CQI);

a base station, comprising:

receiving means for receiving the CQI;

decoding means for decoding the CQI;

computing means for computing a first decision metric and a second decision metric of the decoded CQI; and .

comparing means for comparing the first and second decision metrics to determine if the CQI contains an error.

17. The system according to claim 16, further comprising action means for performing an action responsive to a given number of CQI errors received by said base station.

18. The system according to claim 17, wherein said action means includes means for providing outer loop power control.

19. The system according to claim 16, wherein said generating means includes calculating means for calculating a downlink signal-to-interference ratio.

20. The system according to claim 16, wherein the first and second decision metrics are a largest decision metric and a second largest decision metric, respectively.

21. The system according to claim 16, wherein said comparing means includes calculating a ratio of the first and second decision metrics.

22. The system according to claim 16, wherein said comparing means includes calculating a difference between the first and second decision metrics.

23. A base station for determining the quality of a transmission channel in a wireless communication system, the system including at least one wireless transmit and receive unit having generating means for generating a channel quality indicator (CQI), said base station comprising:

receiving means for receiving the CQI;

decoding means for decoding the CQI;

computing means for computing a first decision metric and a second decision metric of the decoded CQI; and

comparing means for comparing the first and second decision metrics to determine if the CQI contains an error.

24. The base station according to claim 23, further comprising action means for performing an action responsive to a given number of CQI errors received by said base station.

25. The base station according to claim 24, wherein said action means includes means for providing outer loop power control.

26. The base station according to claim 23, wherein the first and second decision metrics are a largest decision metric and a second largest decision metric, respectively.

27. The base station according to claim 23, wherein said comparing means includes calculating a ratio of the first and second decision metrics.

28. The base station according to claim 23, wherein said comparing means includes calculating a difference between the first and second decision metrics.

29. An integrated circuit, comprising:

an input configured to receive a channel quality indicator (CQI) message;
decoding means for decoding the CQI message;
computing means for computing a first decision metric and a second decision metric of the decoded CQI message; and
comparing means for comparing the first and second decision metrics to determine if the CQI message contains an error.

30. The integrated circuit according to claim 29, wherein the first and second decision metrics are a largest decision metric and a second largest decision metric, respectively.

31. The integrated circuit according to claim 29, wherein said comparing means includes calculating a ratio of the first and second decision metrics.

32. The integrated circuit according to claim 29, wherein said comparing means includes calculating a difference between the first and second decision metrics.

33. An integrated circuit, comprising:
an input configured to receive a channel quality indicator (CQI) message;
a Reed-Muller decoder for decoding the CQI message;
a compute decision metric device for computing a first decision metric and a second decision metric of the decoded CQI message; and
a compare decision metric device for comparing the first and second decision metrics to determine if the CQI message contains an error.

34. The integrated circuit according to claim 33, wherein the first and second decision metrics are a largest decision metric and a second largest decision metric, respectively.

35. The integrated circuit according to claim 33, wherein said compare decision metric device calculates a ratio of the first and second decision metrics.

36. The integrated circuit according to claim 33, wherein said compare decision metric device calculates a difference between the first and second decision metrics.